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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,012	02/12/2002	Jun Kamatani	00684.003320	6666

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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/073,012

Applicant(s)

KAMATANI ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 48-88 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 48-88 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

Art Unit: 1774

1. This Office action is in response to applicant's amendment received February 22, 2005, which amends the specification and claims 49, 54, 81 and 86.

Claims 48-88 are pending.

2. The rejection of claims 49-56 and 81-88 under 35 U.S.C. 112, 2nd paragraph, as set forth in the Office action mailed November 17, 2004, is overcome by applicant's amendment.

3. The amendment filed February 22, 2005 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The paragraph bridging pages 16 and 17 has been amended to read in part: "Rp-Ph is a 1-(3,4,5,6-tetrafluoro)-(2-methyl)phenyl group". There is no support for Rp-Ph as a 1-(3,4,5,6-tetrafluoro)-(2-methyl)phenyl group. This terminology requires the phenyl group, as present in the metal coordination compound, to be substituted with four fluorines and a methyl group, as well as to be bonded to an isoquinoline group and iridium. This is not disclosed in the application as originally filed, and is not possible as there are only four possible substitution sites in addition to the bonding positions to isoquinoline and iridium.

In the amended paragraph, "1-(3,4,5,6-tetrafluoro)-(2-methyl)phenyl" is indicated as replacement text for "1-(3,4,5,6-tetrafluoromethyl)phenyl". The examiner notes that the previous version of this paragraph recited "1-(3,4,5,6-tetrafluorophenyl)" rather than "1-(3,4,5,6-

Art Unit: 1774

tetrafluoromethyl)phenyl". "1-(3,4,5,6-tetrafluorophenyl)" was supported by the original disclosure.

With respect to the last three lines of the amended paragraph. The phrase "substituted at a 4- or 5- position" should appear after "a trifluoromethyl group" rather than at the end of the paragraph. IsoQ-R'q as a whole is a 3,4,5,6,7,8-hexafluoroisoquinoline group whereas "substituted at a 4- or 5- position" refers to a position for an R substituent on IsoQ.

Applicant is required to cancel the new matter in the reply to this Office Action.

4. Claims 48-88 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. (US 2001/0019782 A1) for reasons of record in the Office action mailed November 17, 2004.

5. Claims 48-88 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kwong et al. (US 2003/0072964 A1) for reasons of record in the Office action mailed November 17, 2004.

6. Applicant's arguments filed February 22, 2005 have been fully considered but they are not persuasive.

Applicant refers to Igarashi's general formula (23). Igarashi's general formula (23) pertains to compounds having two phenylquinoline ligand and a diketone ligand whereas Igarashi's formulae (10) and (20), which are referenced by the examiner in the rejection, provide for compounds having one or more vertical (applicant's terminology) phenylisoquinoline (piq)

ligands. Igarashi's compound of formula (1-56) on page 15 is a specific example of a prior art compound having a vertical piq ligand. The examiner referenced the formula on page 20 (general formula (23)) for the diketone ligand structure shown in the formula.

Applicant argues that to arrive at the first two structures in present claim 48, a skilled artisan would have to rearrange the fused rings (of general formula (23)) and would have to select from a large list encompassing thousands of possible substituents to provide the specific substituents on the phenylisoquinoline ligand. With respect to the other structures set forth in present claim 48, applicant argues that a skilled artisan would further have to choose a specific bidentate ligand from a disclosure of thousands of possibilities, and would have to choose a specific bidentate ligand and substituents from thousands of possibilities.

A compound of the third formula set forth in present claim 48 is the most similar in structure to any specific compound disclosed by Igarashi et al. One would not have to make numerous modifications to one of Igarashi's specific compounds in order to arrive at the compound of the third formula in claim 48. The only modifications that one of ordinary skill in the art would have to make to Igarashi's compound of formula (1-56) in order to arrive at a compound of the third formula in present claim 48 would be to choose to have one phenylisoquinoline ligand instead of two, and have two phenylpyridine ligands instead of one. The examiner maintains the position that given Igarashi's teachings as a whole, one of ordinary skill in the art would have reasonably expected that compounds having the same ligands in different ratios would have similar properties and could be used for the same purposes. There is

Art Unit: 1774

no evidence of record to demonstrate that the compound of the third formula in claim 48 provides superior/unexpected results compared to Igarashi's compound of formula (1-56).

With respect to the remainder of the compounds within the scope of claim 48, it is the examiner's position that the ligands required by these compounds would have been *prima facie* obvious to one of ordinary skill in the art given Igarashi's teachings of preferred ligands and preferred substituents, and given Igarashi's specific compounds. Based on Igarashi's disclosure, one of ordinary skill in the art would reasonably expect that iridium compounds utilizing various combinations of substituted and unsubstituted ligands suggested by the prior art would be suitable for use as a light emitting material in an organic electroluminescent device. There is no evidence of record to demonstrate superior/unexpected results commensurate in scope with the claims.

With respect to claims 48-56 and the prior art of Kwong et al., applicant argues that there are thousands of possible structures that can be drawn from Kwong's disclosure, and there is not enough disclosure to direct a skilled artisan to the presently claimed invention. Absent a showing of superior/unexpected results commensurate in scope with the claims, the examiner maintains the position that the presently claimed compounds, and luminescent devices incorporating such compounds, would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention. Kwong et al. teach that the choice of substituents influences HOMO and/or LUMO levels of the compound, and affects the color of light emitted by the compound. One of ordinary skill in the art would have been motivated to make a variety of

compounds within Kwong's generic disclosure in order to provide a variety of compounds suitable for use in a luminescent device.

With respect to claims 57-87, applicant argues that neither Igarashi nor Kwong disclose or suggest iridium coordination compounds with three identical vertical piq ligands. Applicant argues that, at most, the prior art discloses two vertical piq ligands. Applicant argues that having one or two vertical piq ligands is substantially different than having three vertical piq ligands. Applicant further argues that it has not been conventionally possible to synthesize metal coordination compounds having three identical piq ligands whereas applicant has been able to synthesize such a compound.

Applicant's basis for stating that it has not been conventionally possible to synthesize compounds such as required by present claims 57-87 is not clear. Applicant has presented no evidence in support of this argument. Igarashi et al. teach that the compounds can be synthesized by known methods (e.g. see paragraph [0086]), and one of ordinary skill in the art would have reasonably expected that a method capable of synthesizing Igarashi's compound of formula (1-60), for example, would be capable of synthesizing a similar compound having a substituted or unsubstituted phenyl group in place of the naphthyl group of (1-60). One of ordinary skill in the art also would reasonably expect that phenylisoquinoline ligands could be coordinated to a metal atom following a procedure similar to that disclosed in paragraph [0175] of the Kwong reference with respect to coordination of phenylquinoline ligands to a metal atom.

Referring to pages 77-80 of the specification, applicant argues that the compounds of present claims 57-87 provide unexpected results compared to conventional organic luminescence

devices in regards to thermal stability, color purity and external quantum efficiency. The only compound within the scope of claims 57-87 that is tested is the compound required by claim 58. The comparison is made to a device comprising Ir(ppy)₃. No comparison is made to devices comprising phenylisoquinoline ligands as disclosed or suggested by the prior art. Each prior art reference discloses one specific compound comprising two phenylisoquinoline ligands (see formula (1-56) on page 15 of the Igarashi reference and see Compound 13 in Fig. 2 of the Kwong reference). Igarashi's compound of formula (1-56) is the same as compound 31 defined in the table on page 41 of the present specification. Kwong's Compound 13 is the same as compound 42 defined in the table on page 41 of the present specification. Based on either prior art reference, one of ordinary skill in the art would recognize that providing different substituents and/or different combinations of ligands could provide compounds having different properties such as different peak emission wavelengths, but which would all be suitable for use as light emitting materials in a luminescent device. There is no evidence of record commensurate in scope with claims 57-87 (or claims 48-56) demonstrating superior/unexpected results compared to similar prior art compounds such as Igarashi's compound of formula (1-56) (present applicant's compound 31) or Kwong's compound 13 (present applicant's compound 42).

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**


Art Unit: 1774

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for Art Unit 1774 is (703) 872-9306 for all official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
May 23, 2005



MARIE YAMNITZKY
PRIMARY EXAMINER

1774